

Amendments to the Specification:

1. Please replace the paragraph beginning at line 3 on page 1 with the following amended paragraph:

The following patent applications disclose related subject matter: Appl. Nos. 09/....., filed (—): 10/633,159, filed 08/01/2003 and 11/550,100, filed 10/17/2006. These referenced applications have a common assignee with the present application.

2. Please replace the paragraph beginning at line 9 on page 1 with the following amended paragraph:

There has been considerable growth in the sale and use of digital cameras, both still and video, in recent years. Figure 4- 1b is a block diagram of a typical digital still camera which includes various image processing components, collectively referred to as an image pipeline. Color filter array (CFA) interpolation, gamma correction, white balancing, color space conversion, and JPEG (or MPEG for video) compression-decompression constitute some of the key image pipeline processes.

3. Please replace the Brief Description of the Drawings section beginning at line 9 on page 2 with the following amended section:

BRIEF DESCRIPTION OF THE DRAWINGS

The drawings are heuristic for clarity.

Figures 1a-1b are a flow diagram for a preferred embodiment method and a preferred embodiment digital camera system.

Figures 2a-2b illustrate an image plus artifacts in the JPEG compressed version of the image.

~~Figures 3-5 show compression for various textures.~~

Figure 3 shows sample values through sections of blocks in Figure 2a.

Figure 4 shows DCT coefficients of the sections of Figure 3.

Figure 5 shows sample values through sections of blocks in Figure 2b.

Figures 6-7 show preferred embodiment metric characteristics.

Figure 6 shows a power spectrum multiplied by a function with positive values for small frequencies and negative values for large frequencies.

Figure 7 shows the normalized integration of two examples of the product of Figure 6.

Figures 8a-8c illustrate a test pattern and preferred embodiment metric distortion indication.

Figure 9 shows test pattern of Figure 8 after preferred method pre-processing and compression.

Figures 10-13 shows a test pattern (Figure 10) and compare preferred embodiment methods (Figure 12) with prior art methods (Figures 11 and 13).

4. Please replace the paragraph beginning at line 17 on page 4 with the following amended paragraph:

A schematic picture of each (intensity) signal pattern (horizontal or vertical through one of the boxes) is shown in Figure 3, and their corresponding DCT coefficient signals are shown in figure 4. Here, the signal is $x(n)$ ($n = 0, 1, \dots, 7$), and the DCT coefficients are defined as.

$$c(k) = \sqrt{\frac{2}{N}} C(k) \sum_n x(n) \cos\left(\frac{(2n+1)k\pi}{2N}\right), C(k) = \begin{cases} 1/2 & k = 0 \\ 1 & k \neq 0 \end{cases} \dots\dots\dots(1)$$

Also, the corresponding compressed ~~spatial~~ spatial signals (inverse DCT after quantization) are shown in Figure 5.

5. Please replace the paragraph beginning at line 21 on page 5 with the following amended paragraph:

The schematic picture of a power spectrum $S(\omega)$ is shown in figure 6 left panel. It is assumed that the spectrum is confined to $-\omega_{th} < \omega < \omega_{th}$. Also, the spatial average of the signal is assumed to be zero; that is, remove any DC component, prior to the following calculations.

6. Please replace the paragraph beginning at line 25 on page 5 with the following amended paragraph:

In order to evaluate the distribution of the spectrum, introduce a metric, J , which measures the distribution of a power spectrum:

$$J = \frac{\int_{-\omega_{th}}^{\omega_{th}} S(\omega)f(\omega)d\omega}{\int_{-\omega_{th}}^{\omega_{th}} S(\omega)d\omega} = \frac{I}{I_0} \dots\dots\dots(2)$$

where $f(\omega)$ is an arbitrary function which shows positive values near $\omega=0$, and negative values near $\omega=\omega_{th}$ (see Figure 6 middle panel). If the power spectrum distribution lies primarily in the low frequency region, the combined signal $S(\omega)f(\omega)$ distribution lies in the low frequency regions with positive values, and J will be positive (see Figure 7 left panel). Contrarily, if the power spectrum distribution lies primarily in the high frequency regions, the combined signal $S(\omega)f(\omega)$ distribution lies in the high frequency regions with negative values, and J will be negative. In short,

- primarily low frequency $S(\omega)$ implies positive J .
- primarily high frequency $S(\omega)$ implies negative J .

Thus the immediate objective is to evaluate J to find the distribution of the power spectrum.

7. Please replace the paragraph beginning at line 25 on page 8 with the following amended paragraph:

Figure 4- 1a is a flow diagram of first preferred embodiment image filtering methods which include the following steps.